A Brief Peer Support Intervention for Veterans with Chronic Musculoskeletal Pain: A Pilot Study of Feasibility and Effectiveness

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Running Head: Peer Support for Veterans with Pain

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Abstract

Objective: To pilot test a peer support intervention, involving peer delivery of pain self-management strategies, for veterans with chronic musculoskeletal pain.

Design: Pre-test/post-test with 4-month intervention period.

Methods: Ten peer coaches were each assigned 2 patients (n=20 patients). All had chronic musculoskeletal pain. Guided by a study manual, peer coach-patient pairs were instructed to talk bi-weekly for 4 months. Pain was the primary outcome and was assessed with the PEG, a 3-item version of the Brief Pain Inventory, and the PROMIS Pain Interference Questionnaire. Several secondary outcomes were also assessed. To assess change in outcomes, a linear mixed model with a random effect for peer coaches was applied.

Results: Nine peer coaches and 17 patients completed the study. All were male veterans. Patients' pain improved at 4 months compared to baseline but did not reach statistical significance (PEG: p = .33, ICC [intra-class correlation] = .28, Cohen's *d* = -.25; PROMIS: p = .17, *d* = -.35). Of secondary outcomes, self-efficacy (p = .16, ICC = .56, *d* = .60) and pain centrality (p = .06, ICC = .32, *d* = -.62) showed greatest improvement, with moderate effect sizes.

Conclusions: This study suggests that peers can effectively deliver pain self-management strategies to other veterans with pain. Although this was a pilot study with a relatively short intervention period, patients improved on several outcomes.

Introduction

Pain is prevalent and costly, affecting at least 100 million Americans and amounting to up to $635 billion annually in direct medical costs and lost worker productivity (1). Chronic pain affects 40-70% of veterans and is a leading cause of disability, resulting in substantial negative impact on millions of veterans' lives (2, 3).

Pain self-management involves treatment adherence, behavioral change, and coping skills, and is an evidence-based treatment for chronic pain (4-8) that has been advocated by both the Institute of Medicine and the 2009 Veterans Health Administration Pain Directive (1, 9). Chronic pain, like other chronic conditions, requires effective self-management for optimal outcomes. Self-management has been defined as "the ability to manage the symptoms, treatment, physical and psychosocial consequences and life-style changes inherent in living with a chronic condition" (10). For patients with chronic pain, self-management involves a combination of treatment adherence, behavioral change, adapting life roles, managing negative emotions, and coping skills. A systematic review by Newman et al. (4) found strong clinical trial evidence that self-management programs are effective for both low back pain and osteoarthritis, with possible secondary benefits in reducing psychological distress (5).

Despite these benefits, pain self-management can be challenging to implement in a busy clinical setting. Primary care appointments, where most chronic pain is managed, are not always conducive to teaching self-management strategies, particularly when discussions about other, potentially life-threatening health concerns, such as diabetes or hypertension, may supersede pain management discussions. Moreover,

primary care providers are not typically trained to provide individualized guidance and support for ongoing pain self-management.

Peer support models are increasingly being used to help patients manage chronic conditions, and have shown promising results. Peer support involves "lay individuals with experiential knowledge who extend natural (embedded) social networks and complement professional health services" (11). Three attributes are believed to define peer interventions: the provision of 1) emotional, 2) informational, and 3) appraisal support (11). Emotional support involves caring, encouragement, attentive listening, reassurance, and avoidance of criticism. Informational support consists of advice, suggestions, dissemination of facts, and problem-solving. Finally, appraisal support involves motivation to persist and endure (e.g., encouragement to "keep going," reassurances that efforts will lead to positive outcomes, assistance in overcoming frustration) (11).

The purpose of the current research was to pilot test a peer support model for chronic pain self-management among veterans. This study, Improving Pain using Peer-Reinforced Self-Management Strategies (IMPPRESS, NCT01748227), examined feasibility of recruiting and retaining peer coaches and patients and tested two hypotheses:

After participating in a peer support intervention for chronic pain self-management, patients with chronic pain will

1) experience lower levels of pain severity and interference, and

2) experience reduced levels of depression, anxiety, pain catastrophizing and pain centrality (measures of negative pain cognitions) and increased self-efficacy, perceived social support, and patient activation.

Methods

All study procedures were approved by the local Institutional Review Board and medical center Review Committee. All participants (peer coaches and patients) signed a written informed consent.

Setting and Participants. Peer coaches and patients were recruited from the 5 primary care clinics at Roudebush VA Medical Center (RVAMC) in Indianapolis, IN. *We first obtained permission from primary care providers (PCPs) to recruit from their patient panel. Because this was a pilot study, we recruited from two PCPs' panels to meet our recruitment goal.* Patients had been diagnosed with musculoskeletal pain (ICD-9 codes 715, 719, 721, 722, 723, 724, 726, 729.0, 729.1, 729.3, 729.5, 738.4, 738.5) that had persisted for at least 6 months, and had at least moderate pain severity, defined by pain ≥ 5 on a 0 (no pain) to 10 (worst pain imaginable) scale. Patients were excluded if they had been hospitalized for psychiatric or substance abuse reasons in the last 6 months, had active suicidal ideation, prior or pending back surgery, severe medical conditions (e.g., New York Heart Association Class III or IV heart failure) that precluded participation, or severe hearing or speech impairment.

Peer Coaches. Peer coaches had participated in one of two prior studies at RVAMC involving pain self-management and had consented to be contacted for future studies.

Intervention. Peer coaches (n=10) attended a 3-hour training session co-led by the study psychologist and nurse. Training consisted of a didactic session, which explained and reviewed chronic pain basics and pain self-management strategies; goal setting, including teaching coaches to guide others in this activity; and motivational interviewing strategies. Demonstrations and role-playing were used.

After training, each peer coach was assigned 2 patients to "coach" and support for 4 months. *To the extent possible, assignments were based on pain location. When this was not achievable, pairs were matched as closely as possible according to age. We assigned 2 patients per coach in an effort not to over-burden any individual coach.* Peer coach-patient pairs were instructed either to meet in person, through phone calls, or a combination of both, a minimum of twice per month for the 4-month period. All participants were given a study manual with the following 6 sections: 1) chronic pain basics; 2) relaxation skills; 3) activity pacing; 4) cognitive behavioral skills, 5) self-care skills, and 6) interpersonal skills. In addition, the following sections were unique to the peer coach manual: 1) what is a peer; 2) cultural competence; 3) communication skills; 4) managing crisis and emergency situation; and 5) motivational strategies.

Peer coaches were asked to draw on the manual as they saw appropriate, while being flexible and responsive to each patient's needs. Coaches were encouraged to share their own experiences with pain management, including successes and failures, to

share strategies that worked for them, help find appropriate strategies for assigned patients, and help set pain self-management goals. In addition, coaches were encouraged to engage patients in social conversation, as appropriate, and offer support and motivation.

Intervention Fidelity. We used several facilitation strategies during the intervention to optimize fidelity. First, peer coaches participated in a 3-hour training session at the beginning of the study. Three separate training sessions were held; all were audio recorded to ensure quality and consistency. Second, peer coaches participated in supervision calls twice per month. During these "booster" sessions, the study psychologist (MK) reviewed, emphasized, and, if necessary, re-educated coaches on expectations for the intervention, such as setting and reviewing goals with patients. Third, a detailed study manual, described above, provided content for peer coaches and their patients to reference and use as needed. In addition to these facilitation strategies, peer coaches and patients were asked in an interview at the end of the study about their experiences with the trial, including the content of their meetings. These included open-ended questions ("What did you talk about in your meetings?") as well as closed-ended questions ("Did you set goals with your peer coach?"). Responses to these questions will be used to facilitate development of a systematic fidelity checklist for use in the follow-up study.

Measures. All patient outcomes were assessed at baseline and 4-month post-intervention follow-up. Pain was the primary outcome and was assessed with the PEG, a validated 3-item version of the Brief Pain Inventory (12, 13), and the PROMIS Pain

Interference measures. The PROMIS symptom measures have had extensive development and population validation by NIH and their use in research is being encouraged across multiple studies, facilitating intra- and inter-disease comparisons (14).

We also assessed several secondary measures. Depression was measured with the PHQ-9. Several studies have validated the PHQ-9 as a diagnostic measure with excellent psychometric properties. Internal consistency has consistently been shown to be high (Cronbach's $\alpha > 0.80$) and test-retest assessment shows the PHQ-9 to be a responsive and reliable measure of depression treatment outcomes (15).

Anxiety was measured with the GAD-7, which has demonstrated reliability ($\alpha = 0.89$) and validity (criterion, construct) as a measure of anxiety in the general population and primary care (16).

Self-efficacy was measured with the Arthritis Self-Efficacy Scale (17), a 6-item measure that has been used in prior studies of patients with chronic pain (5, 18).

Perceived social support was measured with the Multi-Dimensional Scale of Perceived Social Support (MPSS). The MPSS includes 12, 7-point Likert scale items. The test-retest reliability and internal consistency is high, ranging from α=.84-.95 across a variety of studies (19, 20).

Patient activation refers to a patient's knowledge, skill, and confidence to self-manage one's chronic health condition (21). Activation was measured with the Patient

Activation Measure (PAM) 13-item Short Form. The PAM has been demonstrated reliable and valid in a variety of studies, with reliability ranging from α =.87-.88 (21-24).

Negative pain cognitions were assessed with two measures: the Pain Catastrophizing Scale and the Centrality of Pain Scale. The Pain Catastrophizing Scale is a 13-item scale that assesses catastrophizing—a pain belief that has been found to be a strong predictor of poor treatment response. Validation studies have found strong evidence of criterion-related, concurrent, and discriminant validity (25). Centrality of pain refers to the degree to which a person views pain as a dominant feature of one's life and identity (26). The Centrality of Pain Scale is a 10-item instrument, with responses measured on a 5-point Likert scale that range from "strongly disagree" to "strongly agree." In its original validation study, the scale demonstrated high internal consistency (Cronbach's α=.90) and construct validity (26). Questions include "Pain controls my life," and "My pain consumes all of my energy."

Participants were not compensated directly for participation in the study (i.e., for meeting with their assigned partners). However, peer coaches were paid $30 to attend the initial training, and peer coaches and patients were paid $30 for outcome assessments.

Data Analysis.

To assess feasibility of recruitment and retention, we tracked the length of time required to recruit peer coaches and patients, reasons for refusal to participate, and retention rates during the 4-month intervention.

To verify that a complete-case analysis was appropriate for outcome measures (i.e., only including participants in the analysis who had both baseline and follow-up assessments), demographics and baseline measures were compared between patients who completed the intervention (n = 17) and those who did not (n = 4). Continuous measures were compared with a t-test and categorical variables were compared using Fisher's exact test.

To examine change between pre- and post-intervention measures in patients, a linear mixed model with a random effect for peer coach was used to assess change scores. The random effect was included to account for the clustering of patients within peer coaches. The intra-class correlation (ICC) was also estimated from this model. Although sample sizes were small, we used parametric tests because no evidence suggested such tests were inappropriate (27). We did not adjust for multiple comparisons, since this practice can obscure potential findings in exploratory contexts (28). To aid in planning future studies based on this pilot data, we report effect sizes.

Results

Feasibility. Recruitment took place February 2013-March 2013. Ten peer coaches were recruited in the first month of participant recruitment. However, two coaches withdrew from the study before training and were replaced within one month. *Sixteen other potential peer coaches were approached and declined participation, citing time as the primary reason for refusal.* Once the intervention began, retention of coaches was high, with 9 of 10 completing the intervention. The peer coach who failed to complete the intervention never engaged with his patients, and his two patients were

reassigned during the first month of the intervention. For patients, 20 were recruited in six weeks; *48 were approached but declined. The most common reasons for refusal were time constraints and believing that their pain was already well-controlled.* Of the 20 recruited, one patient withdrew prior to initiation of the intervention. Therefore, an additional patient was recruited to reach the goal of 20. Retention of patients was also high; of the 20 patients who started the intervention, 17 completed.

Meetings. Based on peer coach report, number of meetings ranged from 3 to 16, with a median of 6 meetings. The majority of meetings took place over the phone. Some peer-patient pairs chose to meet at the VA, either in the cafeteria or coffee shop, at least once during the intervention, but met via telephone for the remainder of meetings.

Fidelity. To enhance fidelity for this pilot study we used several facilitation strategies, described in the Methods section. Data from post-intervention interviews will be used to create a systematic fidelity checklist for use in a large follow-up study.

Baseline characteristics. Peer coaches' ages ranged from 50-71 (Mean=60, SD=7) years and all were male veterans. Eight were White, 1 Black, 1 Hispanic. *See Table 1 for peer coach and patient demographics. Baseline characteristics of peer coaches are in Table 2.*

Patient demographics and baseline scales did not differ significantly between completers (n = 17) and non-completers (n = 3), with the exception of employment status (Fisher's exact test p-value = .046). All non-completers were employed or retired, whereas 65% of completers were unable to work. For these reasons and the small number of non-completers, all non-completers were dropped from analysis.

Patients' ages ranged from 35-66 (Mean=58, SD=8) years; 9 were White and 8 were Black. All were male veterans. Patients' pain locations were as follows: low back (n=8), neck (6), knees (1), shoulders (1), "everywhere" (1).

Outcomes. Patients' pain severity and pain interference improved at 4 months compared to baseline but did not reach statistical significance (p = .33, ICC = .28, Cohen's *d* = -.25 for PEG; p = .17, *d* = -.35 for PROMIS). For secondary outcomes, depression showed little improvement (p = .47, *d* = -.17). Anxiety (p = .11, *d* = -.36), self-efficacy (p = .16, ICC = .56, *d* = .60), patient activation (p = .12, ICC = .40, *d* = .49), perceived social support (p = .11, *d* = .37), centrality of pain (p = .06, ICC = .32, *d* = -.62), and pain catastrophizing (p = .12, *d* = -.42) all improved in the expected direction. ICC values not reported were estimated to be zero. See Table 3.

Discussion

Patients with chronic musculoskeletal pain who were paired with a peer coach for 4 months improved on all outcomes measured. In particular, self-efficacy, pain centrality, and patient activation showed moderate effect sizes (*d* = .49 to .62). This is potentially important given that self-efficacy and patient activation (i.e., having the knowledge, skills, and confidence to self-manage) are integral to effective self-management. Indeed, higher levels of patient activation are associated with greater adherence to treatment recommendations and self-management behaviors (23, 29, 30). Although pain centrality is a relatively new construct, decreases on this measure suggest that pain became less of a focal point in patients' lives after the intervention, potentially facilitating patients' ability to cope with their chronic pain (26).

The three outcomes with the largest effect sizes (self-efficacy, pain centrality, and patient activation) also had the highest intra-class correlations (ICCs), suggesting that some peer coaches may have been more effective than others. Because ICCs are unstable with small sample sizes, this is speculative but identifies an important question for future investigations of peer support for chronic pain.

It is important to note that, although some peer coach-patient pairs met more frequently than the recommended 8 times in the 4-month period, the median number of meetings was 6. The recommendation of 8 meetings for the pilot was specified a priori, and it might be that fewer meetings are necessary to achieve a desired effect, or that the number of meetings naturally varies based on participants' individual needs. Future work is needed to determine if there is an optimal intervention "dose" and whether this dose has an influence on outcomes.

This pilot study also provides important data related to the feasibility of a peer support intervention for veterans with chronic musculoskeletal pain. All participant recruitment was completed within two months of the initiation of recruitment, including replacing the two peer coaches and one patient who were recruited but withdrew before the intervention began. Retention rates for peer coaches and patients who began the intervention were relatively high (9 of 10, 90%, for peer coaches; 17 of 20, 85%, for patients). Results of this pilot study suggest that a larger study of peer support for veterans with chronic musculoskeletal pain is feasible. Given the value that patients with chronic pain place on motivation and support (31, 32), coupled with the lack of time PCPs and other health care providers are confronted with, a peer support

model for chronic pain might be a helpful addition to patients' pain management treatment plans.

This study is limited in that it was a pilot study with a relatively small patient sample, and thus was underpowered to determine effectiveness. The sample was limited to one VA medical center, all male participants, and older veterans (mean age=58 years), which limits generalizability of findings. However, this study has provided effect sizes to help determine necessary sample size for a larger, fully-powered study, while also demonstrating the feasibility of recruiting and retaining peer coaches and patients for a peer support intervention for veterans with chronic musculoskeletal pain. Future research, with a larger, more diverse sample, will facilitate further examination of the effectiveness of peer support for chronic pain self-management.

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Table 1: Demographics for IMPRESS Study (**Peers: N = 9 and Patients: N = 17**)

Demographic variable		**Peers N (%)**	**Patients N (%)**
Gender	Male	9 (100%)	17 (100%)
Race	White	7 (78%)	9 (53%)
	Black	1 (11%)	8 (47%)
	Hispanic	1 (11%)	0 (0%)
Marital status	Married	8 (89%)	8 (47%)
	Divorced	1 (11%)	6 (35%)
	Never married	0 (0%)	2 (12%)
	A member of unmarried couple	0 (0%)	1 (6%)
Education	High School or less	0 (0%)	5 (29%)
	Some College	4 (44%)	8 (47%)
	4-year college degree	4 (44%)	4 (24%)
	post-graduate degree	1 (11%)	0 (0%)
Employment	full-time	2 (22%)	2 (12%)
	self-employed	0 (0%)	2 (12%)
	part-time	1 (11%)	0 (0%)
	retired	5 (56%)	2 (12%)
	unable to work	1 (11%)	11 (65%)
Income	Comfortable	4 (44%)	4 (24%)
	Just enough	5 (56%)	6 (35%)
	Not enough	0 (0%)	6 (35%)
	Refuse to answer	0 (0%)	1 (6%)
Military service	Peacetime	0 (0%)	4 (24%)
	Vietnam Era	5 (56%)	12 (71%)
	Gulf War	2 (22%)	1 (6%)
	Other	2 (22%)	0 (0%)
Age	Mean (SD)	59.9 (6.7)	58.0 (8.1)

Table 2. Baseline Measures for Peer Coaches

Measure	N	Mean	SD
PROMIS	9	52.02	8.43
PEG	9	9.78	6.80
Depression	9	3.67	3.87
Anxiety	9	1.78	2.17
Self-Efficacy	9	7.20	2.70
Social Support	9	66.22	15.40
Centrality of Pain	9	19.89	7.41
Pain Catastrophizing	9	7.33	7.66

Table 3. Outcome Measures for Patients

		Baseline		4-Month					
Measure	N	Mean	SD	Mean	SD	r	Effect Size	p-value	ICC
PROMIS	17	64.04	5.32	61.64	8.20	.54	-.35	.17	-
PEG	17	22.53	4.03	21.29	5.59	.58	-.25	.33	.28
Depression	17	11.01	8.03	9.82	5.75	.58	-.17	.47	-
Anxiety	17	7.61	5.98	5.71	4.43	.65	-.36	.11	-
Self-Efficacy	17	4.35	2.20	5.58	1.86	0	.60	.16	.56
Patient Activation	17	41.22	5.69	44.00	5.58	.44	.49	.12	.40
Social Support	16	59.29	18.87	66.25	18.45	.62	.37	.11	-
Centrality of Pain	17	34.00	8.03	28.71	8.98	.47	-.62	.06	.32
Pain Catastrophizing	17	29.24	11.13	24.12	13.28	.45	-.42	.12	-